

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VII

DECEMBER, 1931

No. 12

EDITORIAL

HERBALS AND BESTIARIES

Descriptions of animals and plants go back to the earliest times and were first conveyed by the graphic arts. Aurignacian man was so skilled as sculptor, fresco painter and engraver on bone and stone that his representations of bison, stags, chamois and salmon are easily identifiable as such and the same thing is true of the animals figured on Egyptian and Assyro-Babylonian bas reliefs. The Assyro-Babylonian lions are unforgettable in respect of dramatic interest. The Egyptian mules have the wicked humorous eye of the mule, the gazelles are unmistakable gazelles, while cobra and ibis are recognizable even in the hieroglyphs. The Cretan bulls, squid and sub-tropical fish are equally life-like. The prehistoric artist was thus the first descriptive zoölogist. In fact, the Greek designation for a painter was "zoögrapher" (*zoographos*). Plants, as not being very plentiful in the inter-glacial periods, or not generally noticed as useful to man, were not represented to any extent before the rise of classical antiquity. The single exception is the primitive wild wheat (*Tritum dicoccum*) of the Mesopotamian plain, which figures in the carvings of Oriental tombs, and with the different species of barley (*Hordeum*), forms a prominent decorative device on later Greek coins, vases, tombs and altars (Pergamon).¹ The Greek coins show very recognizable species of such plants and fruits as the rose, lily, ivy, pars-

¹See P. Wolters: *Gestalt und Sinn der Aehre in antiker Kunst. Die Antike*, Berlin and Leipzig, 1930, VI, 284-301.

ley, grape-vine, apple, quince, pomegranate, poppy, barley, wheat, olive, date-palm, fan-palm, laurel and oak, and of such animals as the horse, dog, sheep, goat, bull, hare, lion, hippopotamus, dove, rooster, turtle, squid, crab, frog and bee.² Greek vases show the correct dentition of the lion, the specific characters identifying the sea eagle and Mediterranean fishes.³ On the textual side, there is sufficient evidence of an Egyptian vegetable materia medica in the prescriptions of the Ebers Papyrus, while a respectable Assyrian Herbal, compiled from the cuneiform inscriptions on 120 baked brick fragments, was published by Campbell Thompson in 1924. The Assyrians knew of some 250 vegetable remedies. A list of 73 plants in the garden of Merodach-Baladan II, King of Babylon (721-702 B. C.) is inscribed on a small clay tablet (No. 46226) in the British Museum.

The culmination of all this was the genuinely scientific natural history of Aristotle and Theophrastus, whose descriptions of animals and plants remained unsurpassed up to the Renaissance. Aristotle was the first scientific zoölogist, Theophrastus the earliest systematic botanist. In the first century of the Christian era, Dioscorides compiled the first materia medica. What happened in the long interim between the decline of classical antiquity and the Revival of Learning? Under the spell of Dioscorides, who classified plants by their medicinal properties rather than their botanical characters, and of Pliny, who substituted a fanciful folklore of plants and animals for the more accurate notations of his great predecessors, the Dark and Middle Ages were to be dominated by two distinct species of popular picture books on natural history, the Herbals and the Bestiaries. After the Assyro-Babylonian herbal, the earliest Greek exemplar of this species

²O. Bernhard: *Pflanzenbilder auf griechischen und römischen Münzen*, Zürich, 1924. P. R. Gaetgens: *Warum und wie sammelt man Münzen und Medaillen?* Halle, 1926, plates XVII-XVIII.

³Morin-Jean: *Le dessin des animaux en Grèce d'après les vases peints*. Paris, 1911. Cited by Singer.

was that of Diocles of Carystos (350 B. C.) which exists only in fragments, edited by Max Wellmann (1901-3). The ninth book of Theophrastus is also a virtual herbal, but compiled from later Alexandrian sources (250 B. C.). In the time of Mithridates of Pontus (120-63 B. C.), the botanist Crateuas compiled his *Rhizotomikon*, the earliest known herbal assumed to have been illustrated. Eleven drawings by Crateuas⁴ probably survive in the early Greek codices of Dioscorides, notably the Julia Anicia (512 A. D.) or Constantinople Codex (St. Mark's Library, Venice) and the Cheltenham Codex of the 10th Century, now in the Pierpont Morgan Library (New York). The Greek text of Dioscorides was translated into Latin in the 5th-6th Century A. D. for the use of the monks at Squillacio. The earliest MS. extant, known as the Lombard Dioscorides, also beautifully illustrated, was made at Monte Cassino in the 9th Century. It contains descriptions of 71 herbs and their properties, adapted from Dioscorides, from a spurious 4th Century Latin herbal attributed to Apuleius and from the botanical chapters in Pliny. This mixture of debased elements and overlaid material is also characteristic of the spurious 9th Century MS. at Rome, known as pseudo-Dioscorides (*De herbis femininis*), a hodgepodge probably compiled in Italy during the 5th-6th Centuries A. D.; and the Vienna palimpsest of 600 A. D., designated by Singer as *Dioscorides vulgaris*, which was first printed at Colle, near Siena, in 1478 and later at Leyden (1512). From these three composite Latin texts, the Lombard Dioscorides, pseudo-Dioscorides and *Dioscorides vulgaris*, came much of the base metal in the mediæval herbals.⁵ The dominating influence was Pliny's Natural History, of which chapters XX-XXV constitute the best known Latin herbal of the first Century after Christ, a series of paragraphic statements deriving from Theophrastus and teeming with errors and superstition. The

⁴Restored by C. Singer in: *Jour. Hellenic Studies*, London, 1927, XLVII, 8-17.

⁵Charles Singer: The Herbal in Antiquity. *Jour. Hellenic Studies*, London, 1927, XLVII, 1-52.

next most important Greek herbal after Dioscorides was the list of drugs and their uses in Books VI-VIII of the *De simplicibus* of Galen. The plants are paragraphed in alphabetical order, with mention of the locality in which each flourished, its differential characters and medicinal uses. The plant is seldom described in full. This alphabetical arrangement (each plant ticketed off as in an auctioneer's catalogue) was to become the pattern for the shorter mediæval herbals, some of which were cast in hexameter verses. Herbals or botanic treatises were also attributed to Herophilus, Andreas of Carystus, Sextius Niger, Pamphilus and Tiberius Claudius Menecrates, to whom Max Wellmann allocates the Greek original of Celsus; but these texts have all been lost. There was a Syriac Herbal, which was virtually a 6th-7th Century translation of Books VI-VIII of Galen's *De simplicibus*. There was the great Arabic Herbal of Ibn Baitar (died 1248), containing the names of nearly 800 plants. There is a bilingual list of plants in Coptic and Arabic, and the equivalent of an Ethiopic or Abyssinian Herbal in the British Museum.⁶ But the great mass of MS. Herbals up to the 16th Century was of European provenance, and derived, as we have seen from Dioscorides, Pliny and pseudo-Apuleius. In the family-trees of these compilations which Singer has traced,⁷ one group of alphabetic lists of plants in Greek is seen to derive from the text of the *Rhizotomikon* of Crateuas *via* an anonymous intermediary. A non-alphabetic group derives directly from the text of Dioscorides, appropriates the illustrations (plant-types) of Crateuas, with a secondary alphabetic offshoot; while a Latin group derives from Dioscorides Lombardus and Dioscorides vulgaris. The Greek original of the Latin Herbal of pseudo-Apuleius (4th Century A. D.) was probably akin to the text of a papyric fragment discovered in Egypt by Johnson in 1904 and is probably assignable to the same period (400 A. D.). The Latin descendants of

⁶For which see Sir E. Wallis Budge: *The Divine Origin of the Craft of the Herbalist*. London, 1928.

⁷Singer: *op. cit.*, 20, 38.

pseudo-Apuleius comprise a South-Italian group, a Germanic group and an Anglo-Norman group, the figures being like those in the Johnson Papyrus. Two Parisian MSS. of the 9th Century represent combinations of the Herbal of pseudo-Apuleius with *Dioscorides vulgaris*. In the 11th Century, the Anglo-Saxon codex of pseudo-Apuleius was combined with an Anglo-Saxon version of the Latin Dioscorides. The figures in this Anglo-Saxon herbal are very like those in certain Latin MSS. of pseudo-Apuleius, formerly at Monte Cassino, while a third variant of these two MSS. was the original of the first edition of pseudo-Apuleius, printed at Rome by Philip de Lignamine about 1481. The figures in this incunabulum make it the closest relative known of the 11th Century Anglo-Saxon Herbal in MS. (Singer). The plant-lore of these English herbals is taken mostly from Pliny: the illustrations of plants are mainly servile copies from South Italian originals, with one remarkable exception. In the Bodleian, at Oxford, is an Anglo-Saxon MS. made at Bury St. Edmunds in 1120, and containing life-like, naturalistic free hand drawings of actual English plants. This stands quite alone in scientific interest. The Anglo-Norman MSS. in the Ashmolean (Oxford) and Sloane (British Museum) collections are gorgeously illuminated, but the drawings are again stiff, trite patternwork. The Latin Dioscorides was also the original of the *Circa instans* of Matthæus Platearius (12th Century), which engendered in turn the text of the *Arbolayre*, the first French Herbal in the vernacular, printed at Besançon by Peter Metlinger about 1490. It passed through at least four successive editions between 1500 and 1535, under the title of *Le Grant Herbiere*. The *Arbolayre* was illustrated with original cuts formerly used in the German *Gart der Gesundheit* (Klebs). The first English illustrated herbal, called the *Grete Herball*, printed by Peter Treveris at London in 1526, was a translation of the *Arbolayre*. One of the most charming of the early German forerunners of the herbal was the *Hortulus* of Walafrid Strabo (809-849), a hexameter poem describing the plants in the garden of the Cloister at Reichenau, which was com-

posed in 827, printed at Vienna in 1510 and edited in modern facsimile by Sudhoff (1927). It was translated into English by R. S. Lambert as "Hortulus or The Little Garden" (London, 1924). Sudhoff likens it to a solitary floweret, plucked by the wayside *en passant*.

The first authentic herbal to be published in Germany was the Latin *Herbarius Moguntinus*, printed by Peter Schoeffer at Mainz in 1484. It consists of descriptions of 150 German garden plants, illustrated by 150 wood cuts, followed by separate accounts of 96 drugs. The names of the plants are given in Latin and German. The work is a compilation from classical, Arabic and Mediæval writers, and as Arnold Klebs points out, was "the prototype for the greater part of all herbals printed in Germany, as well as in Italy, France and Holland during the 15th Century."⁸ It was reprinted at Mainz, Speyer and Louvain during the year of its initial publication (1484) and passed through ten subsequent editions during 1485-1520, and seven Italian translations, under the title *Herbolario volgare* (1522-65). As Klebs observes, it was Schoeffer's curtain-raiser for a more momentous enterprise, the *Gart der Gesundheit* (Mainz, Peter Schoeffer, 1485), an entirely independent compilation in the vernacular, comprising 435 chapters covering the entire known pharmacopœia of the period, with nearly 400 new illustrations, which constitute a land-mark in the depiction of plants from nature. It passed through 18 German editions (1485-1530), a low German version (*Gaerde der Suntheit*, Lübeck, 1492), and five editions of a Dutch version (1514-47). The Latin *Hortus sunitatis*, the next most important German herbal, is not a translation of the *Gart der Gesundheit*, as commonly supposed, but contains 1066 chapters, of which 530 are on plants and the rest on animals, birds, fishes, stones, and minerals and the urine, followed by a long index of the therapeutic indications of the plants described (Klebs). The illustrations, 1066 in number, include 379

⁸For Klebs' final exegesis of the German Herbals, see his *Catalogue of Early Herbals*, Lugano, L'Art Ancien, 1925.

of the pictures of plants from the *Gart der Gesundheit* and 151 newer drawings. The first edition was printed by Jacob Meydenbach at Mainz in 1491 and was followed by four Strassburg editions (1497-1517), two Venetian reprints (1511-38) and two French translations (Paris, 1500-29). From these three German herbals, it is but a step to the magnificent illustrated tomes of the German Fathers of Botany, Brunfels, Fuchs, Egenolph and Bock (1530-60). But with the advent of these men, we are already in the full current of the scientific botany of the Renaissance. From the Salernitan hexameter herbal of Macer Floridus came the two Danish herbals of Henrik Harpestreng (13th Century), but consideration of the Scandinavian and Russian herbals would lead us too far. In the Orient, Dioscorides was translated into Arabic in 854, again about 951, and into Syriac by Bar Hebraeus about 1250. There are several Arabic MSS. of Dioscorides, containing illustrations germane to Oriental flora. Dioscorides is to this day the current materia medica of the Islamic world (Singer).

In the pharmacopœias of Western Europe, the great influence of Galen was still paramount, even well into the 18th Century, when vegetable simples were still called Galenicals. But with the advent of the scientific botany of the Renaissance, the herbal had really outlived its period of usefulness. Its spirit lingers on in the plant-lore of primitive peoples, in such American survivals as Thomsonianism, and in the mentality of the herb-doctor himself, as adumbrated by Singer:

"Scattered here and there among the meaner streets of our great cities are shops bearing over the window the word *Herbalist*. In these little dens of bygone superstition the artless folklorist sometimes seeks for remnants of early English folk belief. Such remnants are, in fact, surprisingly rare and few. If he enter in search of them the innocent inquirer will either be disappointed or, if satisfied, he will be deceived. The lore that the out-at-elbow practitioner purveys to him is not that of the ancient Anglo-Saxon, whose medical system was too debased or too primitive to survive. It is rather the misunderstood and misinterpreted remains of Pliny and Apuleius, of Dioskurides and Galen, perverted at fortieth hand. Our herbalist's methods are tinged too with Astrology. As like as not his

whole library consists of one of the numerous descendants of Nicholas Culpepper's *English Physician Enlarged* of 1643. This poor, shabby and pretentious fellow, half deceived and half deceiver, is the descendant of Diokles of Athens and Krateuas of Pontus. Their lore has come to him through the ages in an unbroken though contaminated line."⁹

Of far different origin and significance were the Bestiaries or Beast-Books, which stemmed from that strange 4th Century picture-book known as the *Physiologus*. According to the recent exegesis of Max Wellmann,¹⁰ the *Physiologus* originated in Cæsarea (Syria) about 370 A. D. and is compounded of Egyptian, Indian, Arabian, Libyan, Jewish and Greek elements derived variously from the book on animals (*Peri zoön*) of Timotheus of Gaza (5th-6th Century), the *Koiranidae* of the Syrian Hermes Trismegistus (1st Century), the *Hieroglyphica* of Herapollon (4th Century) and from the fragments of Democritus, as filtered through the *Physica* of Bolos (1st Century). These sources Wellmann then traces back to remoter originals, viz., Timothy of Gaza to the Syrian *Peri zoon* of Tatian (2nd Century), the Hermetic *Koiranidae* to the neo-Pythagorean philosopher, Anaxilaus of Larissa (28 B. C.), Herapollon to Chairemon and Bolos, and Bolos to Anaxilaus. These in turn derive from Aristotle, Theophrastus, Herodotus, Juba and Pliny. The immediate model of the *Physiologus* was a shadowy *Physica* of Didymus of Alexandria (4th Century). It is not proposed to go into the complex web of parallel citations, deductions and conjectures by which Wellmann arrives at these conclusions. Let us now consider the *Physiologus* itself. Conceived by a Christianized Greek in Syria, translated into all languages and exerting immense influence upon the ecclesiastical art and general culture of the Middle Ages, its earliest known versions are the Syriac and the Ethiopic (5th Century, A. D.), its latest an Icelandic translation of the 13th Century. The most instructive Greek text is the so-called Smyrna or Byzantine *Physio-*

⁹Singer: *op. cit.*, 50.

¹⁰Wellmann: *Der Physiologus: eine religionsgeschichtlich-naturwissenschaftliche Untersuchung*. Leipzig, 1930.

logus, a manuscript of 137 pages (*circa* 1100) in the Library of the Evangelical School at Smyrna, illustrated with 106 miniatures, and edited by Josef Stryzykowski (1899)¹¹

In its original form, the Greek *Physiologus* or Naturalist consisted of about 40 chapters, professing to draw somewhat far-fetched religious injunctions or moral lessons from decidedly fanciful traits and peculiarities of various animals. Its intention was thus allegorical or mystic. While it is said to have been denounced in a Papal decree of 500 as the work of heretics, falsely attributed to St. Ambrose and St. Epiphanius, its enormous popularity, Wellmann thinks, was due to the fact that it ultimately acquired a kind of sanction as a symbolic supplement to Holy Writ. As time went on, the Latin version of this book of symbolic zoölogy expanded to include as many as 200 chapters, covering beasts, birds, fishes, reptiles, plants and stones. This development was called the Bestiary. By the 9th Century, the *Physiologus* had been rendered into Anglo-Saxon, by the 11th Century it had gotten into German, in the 12th-13th Centuries, there were innumerable French Bestiaries and an English metrical Beast Book is allocated to the 13th Century. By this time, the animal-lore of the *Physiologus* had become part and parcel of the scheme of ornamentation in architecture and of imagery in poetry and imaginative literature. The *physis* or "nature of the beast," in each case, was a pure figment of fancy. A few specimens from the Smyrna *Physiologus* will suffice to show the general tendency. The book begins with

¹¹J. Stryzykowski: *Der Bilderkreis des griechischen Physiologus* [Byzant. Archiv, Heft 2]. Leipzig, B. G. Teubner, 1899. Illustrated by 23 drawings from the Smyrna MS., dull, lifeless delineations in the Byzantine manner, on yellow parchment, which are remarkably like those in the illustrated commentary of Apollonius of Kitium on the Hippocratic tract on dislocations (Leipzig, 1896). As the editor observes, the Smyrna pictures are far from representing the height of 11th Century Byzantine art.

THE LION

The Naturalist says the Lion has three traits: First, when pursued, he wipes out his tracks with his tail, so that huntsmen may not follow him to his lair or hiding place. So, too, the divinity of Christ was concealed after the Annunciation and the Incarnation. Second, he sleeps with his eyes open: an allegorical symbol of the Crucifixion. Third: his cubs are born dead, but resuscitated on the third day when the male parent roars over them: an allegorical symbol of the Resurrection.

THE LIZARD

When the Lizard gets old, it becomes blind, but by sunning itself through a crevice in a wall facing to the East, it becomes young again. So let man, in his blindness, seek Christ.

THE ANT

The Naturalist says of the ant: it has three peculiarities: 1. If it lacks corn, it will not disturb another ant bearing a grain, but will go and fetch one for itself: Parable of the Wise and Foolish Virgins. 2. It bites each kernel of corn, so that it may not germinate, and so provides for the winter. Do thou also distinguish the spirit of the Gospel from the letter, lest it destroy thee. 3. It gathers wheat and shuns barley. So, hold thou fast to the true faith.

THE FOX

The Naturalist says of the fox: when hungry, it feigns death and so catches birds that light upon it to feed; and such are the wiles of the Devil.

So also, the Phoenix, which arises on the third day from its own ashes, symbolizes the Resurrection, the Unicorn, which only permits itself to be captured on the lap of a pure virgin, stands for the Incarnation, the Pelican, which feeds its young with its own blood, typifies the salvation of mankind by the Crucifixion. All this was germane to the many metaphors about animals in the Bible, such as the deaf adder, the little foxes, the Paschal Lamb, and was reëchoed in such literary allusions as "crocodile tears" or the bear licking her cubs into shape. Allusions from the *Physiologus* are easily found in Dante, Cervantes, Shakespeare and the elder poets and dramatists. The unicorns, griffins, leopards and panthers found their way into heraldry, the phoenix is even now a symbol of fire insurance, while the illustrations in the *Physiologus*, particularly the more fanciful beasts, became the staple of the gargoyles on mediæval cathedrals, of which Viollet le Duc affirmed that

no two were ever alike. A fairly complete Bestiary is said to be carved around the south doorway of Alne Church in Yorkshire. Another is painted on part of the nave of St. Savin le Mont. Meanwhile, animals, plants, and even the human skeleton and visceral *schema*, came to be depicted with ever increasing skill by the miniature painters of the Books of Hours and in the MSS. illustrations of such books as Bartholomew de Glanvil's *De proprietatibus rerum*.¹² By the time that Leonardo was finishing his wonderful anatomical drawings, the spirit of the scientific botany and zoölogy of Theophrastus and Aristotle had been re-awakened. Before the second edition of Vesalius had been published (1555), scientific comparative anatomy had already got its stride in such illustrated books on zoölogy as those of Pierre Belon (1551), and Guillaume Rondelet (1554). In 1575, we have Volcher Coiter's serial illustrations of comparative osteology, by 1598 Carlo Ruini's Anatomy of the Horse, by 1601, such things as Casserius' plate showing the ossicles of the ear in man, the calf, the horse, the dog, the cat, the hare, the goose, the mouse and the pig. Childish as the reasoning, puerile as the drawings, the Herbals, the *Physiologus* and the Bestiaries have their place in this continuity—the only substitutes for botany and zoölogy the Dark and Middle Ages had.

In a charming lecture on the Bestiary,¹³ Dr. Montague R. James, the learned Provost of Eton, summarizes as follows:

"When you see a griffin on a crest or supporting a coat of arms, or an antelope, or a pelican plucking at its breast, or a phoenix on a Life Insurance badge, or, most familiar of all, a unicorn, you are looking at something which but for the Bestiary would not have been there."

And the probable reason for the appearance of these creatures on the seals of great nations or the armorial bearings of noble families was that they were emblems of

¹²Note the remarkable drawings of animals and plants from a MS. of 1482 on pl. XI in Charles Singer's *Studies in the History of Science*, Oxford, 1921, II, opposite p. 38.

¹³M. R. James: *History*, Lond., 1931, n. s., XVI, 1-11.

the ethical and religious allegories attaching to them in the age-old *Physiologus*. As to the cast of mind which brought all this about, Dr. James is of opinion that "it can plausibly be compared to the child's mind, but the mediæval people were not children. The fact is," he goes on to say, "that to them the accurate observation and investigation of nature had not begun to seem important by comparison with matters of conduct and religion, not to speak of war, law and art." This is unquestionably true, but the astonishing thing about the peoples of the Middle Ages is, not so much their mental limitations, as the persistence of this mental backwardness in certain branches of science for a thousand years, from the downfall of the Western Roman Empire to a period well beyond the fall of Constantinople, the invention of printing and the discovery of America. Considering the tiny *Hortulus* of the Abbot of Reichenau to the pensive melody of Schumann's *Einsame Blumen*, one recalls Osler's phrase about "the long night of the Middle Ages." For all this, many ingenious reasons have been assigned—the aspiration of the different tribal groups toward nationhood, the Feudal System, religion,¹⁴ the mediæval concept of the State, the wars, epidemics and famines of the times, but if anything is to be blamed for the phenomenon, it would be the limited, fallible and unreliable nature of the human mind itself, of which recent humanity has had abundant experience since the World War. In the matter of aspiration toward nationhood, Germany and Italy did not attain to national unity until 1870, and Russian science was vir-

¹⁴Max Wellmann (*op. cit.* 115) takes this line ("*Die Schuld trifft die Religion*") and traces the mystical elements in literature of the *Physiologus* type to the neo-Pythagorean monks in Egypt, from whom it was copied by the Essenes in Palestine and the Hermetics in Egypt and Syria. In his terminal sentence, he denounces the heathen and Christian monkish orders of these times as "the executioners of natural science in antiquity" (*die Henker der naturwissenschaftlichen Naturerkenntnis im Altertum*). This, however, does not entirely account for the popularity of the *Physiologus* for over a thousand years. The true explanation is the almighty power of tradition (Sudhoff), in other words, the disinclination of the human mind, in certain periods, to overcome inertia and venture into untried paths.

tually non-existent for nearly eighteen centuries after the birth of Christ. The fundamental error of Waitz's Anthropology, as pointed out by Sir Richard Burton and others, was the idea that ability is not innate, but the result of culture of any particular type, instead of the other way around. "Much learning" said Heraclitus, "does not develop mind,"¹⁵ nor did the Revival of Learning revive the emancipating individualizing spirit of Greek scientific thought, but only a way of appreciating it. No power on earth could have stopped a mediæval scientist from discovering Ohm's law or the binomial theorem or the bacterial causation of communicable diseases, if he had had the properly constituted mentality for such a feat. Indeed, Thomas Aquinas, the most mediæval of all mediæval thinkers, regarded intellectual contemplation, the honest reactions of a sensitized photographic plate, as a beatitude; and so intense was mediæval conviction that suffering humanity has been penalized by the brainless blundering of its leaders that Dante begins by defining the hell of his visions as the specific limbo of the decerebrate—

"Le genti dolorose,
C'hanno perduto 'l ben dell' intelletto"

Goethe's view (that of the Provost of Eton) is broader and more humorous:

"Verständige Leute kannst du irren sehn,
In Sachen, nämlich, die sie nicht verstehen."

Even more tolerant is this little sentence of Trousseau:

"Les empiriques, chose triste à dire, ont toujours beaucoup d'accès auprès des gens d'esprit."

¹⁵An amusing example is that of the individual in the Spoon-River Anthology who studied the calculus to build a steam-engine:

"And all Spoon River watched and waited
To see it work, but it never worked.
And a few kind souls believed my genius
Was somehow hampered by the store.
It wasn't true. The truth was this:
I didn't have the brains."

The truth is that once the well-springs of Greek science were dried up, mediæval science had little to go on until a few spirits, bolder than the rest, introduced the idea of experimentation. Other things being equal, such inventions and discoveries as printing, firearms, the mariner's compass, spectacles or the use of mercurials were taken up as rapidly in the later Middle Ages as were electric motors, telephoning, radio, aviation, vaccination, auscultation, anæsthesia, antisepsis or the Röntgen rays in our own period. But Galileo's thermometer and the pulse-timing of Galileo, Kepler, Cusanus and Sanctorius had to wait until physicians knew what pulse and temperature really signify. The Herbals and Bestiaries illustrate the anonymous, collectivistic spirit of the mediæval peoples, the preference of the masses of humanity for cults and fashions that do their thinking for them in certain directions, and of that tendency we have a surfeit in the movie mentality, jazz rhythms in place of music and radio announcements of the present hour.

F. H. GARRISON.
